

FROM  
VISWA LAB

TO  
GREAT EASTERN SHIPPING CO. LTD

ATTN: DAVID BIRWADKAR

Vessel Name : JAG PRANAV(IMO No: 9281932)  
VLC Log No : H140898098  
Place & Date Sent : HOUSTON - UNITED STATES, ; 01-Aug-2014  
Date Received at VL : 04-Aug-2014

CUSTOMER FURNISHED DATA:

Bunker Port & Date : HOUSTON-UNITED STATES ; 13-Jul-2014  
Bunker Supplier : BP MARINE  
Barge : M.T BRITISH EMISSARY  
Sample Grade : IFO380-RMG380LS  
Sample Seal No : 0804891 - Sealed  
Bunker Quantity : 410.000 MT  
Bunker Density @15°C : 988.0 kg/m3  
Bunker Viscosity @50°C : 222.3 cSt  
Sulphur Content : 0.98 %  
Water Content : 0.15 %  
Source of the sample : MANIFOLD  
Sampling Method : DRIP

SPECIFIED PARAMETERS FOR IFO380-RMG380LS & TEST RESULTS

Parameters	Units	Test Results	Specification Limits
Density @ 15°C	kg/m3	988.0	( 991.0 Max )
viscosity @50°C	cSt	230.8	( 380.0 Max )
Upper Pour Point	°C	6	( 30 Max )
Carbon Residue	% (mass)	10.48	( 18.00 Max )
Ash	% (mass)	0.020	( 0.100 Max )
Water	% (vol)	0.10	( 0.50 Max )
Sulphur	% (mass)	0.96	( 1.00 Max )
Total Sediment Pot.	% (mass)	0.01	( 0.10 Max )
Vanadium	ppm	23	( 350 Max )
Al + Si	ppm	35	( 60 Max )
Flash Point	°C	> 70	( 60 Min )
Calcium	ppm	10	( - Max )
Zinc	ppm	1	( - Max )
Phosphorus	ppm	< 1	( - Max )
Sodium	ppm	11	( 100 Max )
CCAI		854	( 870 Max )

ADDITIONAL PARAMETERS

Parameters	Test Results	Units
viscosity @100°C	25.7	cSt
API Gravity	11.64	
Aluminium	16	ppm
Silicon	19	ppm
Iron	34	ppm
Lead	< 1	ppm
Nickel	5	ppm
Magnesium	1	ppm
Potassium	4	ppm

CALCULATED VALUES

Parameters	Computed Val	Units
Net specific energy	40.88	MJ/kg
Gross specific energy	43.22	MJ/kg
Temperature at injection (for 13 cSt)	124	°C
Minimum Transfer Temperature	36	°C

Engine Friendliness Number (EFN : 1 to 100) : 53

#### CONFORMANCE:

The fuel sample tested conforms to Table 2 of ISO 8217:2010 specifications for grade IFO 380 - RMG380 LS

#### COMMENTS:

High Iron

High iron content can cause damage to fuel pump and fuel nozzle. Ensure purification and filtration systems are functioning efficiently.

#### SUGGESTIONS & RECOMMENDATIONS TO SHIP OWNERS/OPERATORS/TECHNICAL STAFF

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Temperature for injection viscosity of 8 cst is 146°C.  
 Temperature for injection viscosity of 10 cst is 136°C.  
 Temperature for injection viscosity of 11 cst is 131°C.  
 Temperature for injection viscosity of 12 cst is 128°C.  
 Temperature for injection viscosity of 13 cst is 124°C.  
 Temperature for injection viscosity of 15 cst is 119°C.  
 Temperature for injection viscosity of 18 cst is 112°C.  
 Temperature for injection viscosity of 20 cst is 108°C.

#### POUR POINT

Observation:

Heat and store this fuel at 10°C above the measured pour point temperature.

#### SULFUR

Observation: This fuel has low sulfur.

High alkalinity of some cylinder oils can cause scuffing and excess wear of cylinder liners.

Make sure cylinder oil used can handle low sulfur fuel.

#### CCAI

Observation: Ignition delay is indicated by CCAI greater than 840 for medium-speed engines and greater than 870 for low-speed engines.

#### OVERALL QUALITY:

Engine Friendliness Number (EFN) is a unique bench-mark of fuel quality evaluated by VISWA LAB from the point of view of engine wear and tear resulting from the use of this fuel. Based on EFN, which is calculated from the analysis results listed in this report, the quality of this fuel is above average.

NOTE: The conformance of this fuel to the contracted specifications may have no relationship to the evaluation of this fuel based on EFN.

High iron content can cause damage to fuel pump and fuel nozzle. Ensure purification and filtration systems are functioning efficiently.

Questions?

Viswa Lab Houston; Tel - +1 713 842 1985; Email - customerhelp@viswalab.com

Viswa Lab Singapore; Tel - +65 6778 7975; Email - singapore@viswalab.com

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Date: 03/09/2014 09:43 PM  
Subject: Report:H140900199 - JAG PRANAV(IMO No: 9281932) - IFO380-RMG380 : Specifications Met EFN: 64

FROM  
VISWA LAB

TO  
GREAT EASTERN SHIPPING CO. LTD

ATTN: DAVID BIRWADKAR

Vessel Name : JAG PRANAV(IMO No: 9281932)  
VLC Log No : H140900199  
Place & Date Sent : CARTAGENA - COLOMBIA, ; 29-Aug-2014  
Date Received at VL : 02-Sep-2014

CUSTOMER FURNISHED DATA:

Bunker Port & Date : POZOS COLORADO-COLOMBIA ; 27-Aug-2014  
Bunker Supplier : CI INTERNATIONAL FUELS  
Barge : INTERGOD VII  
Sample Grade : IFO380-RMG380  
Sample Seal No : 0804896 - Sealed  
Bunker Quantity : 500.000 MT  
Bunker Density @15°C : 975.1 kg/m3

Bunker Viscosity @50°C : 378.0 cSt  
 Sulphur Content : 1.81 %  
 Water Content : 0.31 %  
 Source of the sample : MANIFOLD  
 Sampling Method : DRIP

#### SPECIFIED PARAMETERS FOR IFO380-RMG380 & TEST RESULTS

Parameters	Units	Test Results	Specification Limits
Density @ 15°C	kg/m3	973.5	( 991.0 Max )
viscosity @50°C	cSt	344.5	( 380.0 Max )
Upper Pour Point	°C	9	( 30 Max )
Carbon Residue	% (mass)	11.50	( 18.00 Max )
Ash	% (mass)	0.030	( 0.100 Max )
Water	% (vol)	0.10	( 0.50 Max )
Sulphur	% (mass)	1.43	( 3.50 Max )
Total Sediment Pot.	% (mass)	0.01	( 0.10 Max )
Vanadium	ppm	138	( 350 Max )
Al + Si	ppm	14	( 60 Max )
Flash Point	°C	> 70	( 60 Min )
Calcium	ppm	8	( - Max )
Zinc	ppm	2	( - Max )
Phosphorus	ppm	2	( - Max )
Sodium	ppm	4	( 100 Max )
CCAI		835	( 870 Max )

#### ADDITIONAL PARAMETERS

Parameters	Test Results	Units
viscosity @100°C	32.9	cSt
API Gravity	13.77	
Aluminium	6	ppm
Silicon	8	ppm
Iron	10	ppm
Lead	< 1	ppm
Nickel	26	ppm
Magnesium	2	ppm
Potassium	< 1	ppm

#### CALCULATED VALUES

Parameters	Computed Val	Units
Net specific energy	40.93	MJ/kg
Gross specific energy	43.30	MJ/kg
Temperature at injection (for 13 cSt)	132	°C
Minimum Transfer Temperature	42	°C

Engine Friendliness Number (EFN : 1 to 100) : 64

#### CONFORMANCE:

The fuel sample tested conforms to Table 2 of ISO 8217:2010 specifications for grade IFO 380 - RMG 380

#### COMMENTS:

#### SUGGESTIONS & RECOMMENDATIONS TO SHIP OWNERS/OPERATORS/TECHNICAL STAFF

Temperature for injection viscosity of 8 cst is 155°C.  
 Temperature for injection viscosity of 10 cst is 144°C.

Temperature for injection viscosity of 11 cst is 140°C.  
Temperature for injection viscosity of 12 cst is 136°C.  
Temperature for injection viscosity of 13 cst is 132°C.  
Temperature for injection viscosity of 15 cst is 127°C.  
Temperature for injection viscosity of 18 cst is 120°C.  
Temperature for injection viscosity of 20 cst is 116°C.

Amount of shortage of fuel supplied based on the difference between the received density and test density is 0.8 MT. Please note that the above difference will be subject to ISO 4259 criteria as given in ISO 8217 Annex F.

#### POUR POINT

Observation:

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Heat and store this fuel at 10°C above the measured pour point temperature.

#### SULFUR

Observation: This fuel has low sulfur.

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High alkalinity of some cylinder oils can cause scuffing and excess wear of cylinder liners.

Make sure cylinder oil used can handle low sulfur fuel.

#### OVERALL QUALITY:

Engine Friendliness Number (EFN) is a unique bench-mark of fuel quality evaluated by VISWA LAB from the point of view of engine wear and tear resulting from the use of this fuel. Based on EFN, which is calculated from the analysis results listed in this report, the quality of this fuel is good.

NOTE: The conformance of this fuel to the contracted specifications may have no relationship to the evaluation of this fuel based on EFN.

#### Questions?

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